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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/768,618	01/25/2001	Setsuo Nakajima	12732-007001	5724

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EXAMINER

ISAAC, STANETTA D

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 08/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/768,618

Applicant(s)

NAKAJIMA ET AL. 

Examiner

Stanetta D. Isaac

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 13-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 13-16, 18, and 19 rejected under 35 U.S.C. 102(e) as being anticipated by Kawasaki et al. Patent Number 6281552.

Kawasaki discloses:

(See FIG. 1A, 11A-11C; col. 5 lines 28, 32-36, 49, 61; col. 6 lines 9-14; col. 10 lines 53-64; col. 11 lines 1-6, 29-40)

13. A method of manufacturing a semiconductor device comprising the steps of:

forming a heat absorbing layer in an island (102 to 104) form over

a substrate;

forming an insulating film (105) over said heat absorbing layer;

Art Unit: 2812

(See FIG. 1A, 11A-11C; col. 5 lines 28, 32-36, 49, 61; col. 6 lines 9-14, 30-36; col. 10 lines 53-64; col. 11 lines 1-6, 29-40)

forming a non-single crystalline semiconductor film (106) on said
insulating film;

(See 11B; col. 11 lines 34-40)

irradiating said non-single crystalline semiconductor film with
light so that said semiconductor layer is melted and solidified;

(See col. 6 lines 9-14, 30-36)

patterning said semiconductor film into a semiconductor island so
that a channel length direction of the semiconductor island is aligned with
an outer edge of said heat absorbing layer.

(See col. 11 lines 34-40)

14. A method according to claim 13 wherein said semiconductor film is
crystallized by said light.

(See col. 5 line 62)

15. A method according to claim 13 wherein said non-single crystalline
semiconductor film is selected from an amorphous semiconductor film (106), a
microcrystalline semiconductor film and a polycrystalline semiconductor film.

(See col. 5 line 62)

16. A method according to claim 13 wherein said semiconductor film
comprises silicon.

Art Unit: 2812

(See col. 5 lines 32-36)

18 . A method according to claim 13 wherein said heat absorbing layer comprises a metal selected from the group consisting of Cr, Mo, Ti, Ta and W.

(See col. 6 lines 31-36)

19. A method according to claim 13 wherein said absorbing layer functions as an electrode (102 to 104) of a storage capacitance of a liquid crystal display device or an EL display device.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 20-33 rejected under 35 U.S.C. 103(a) as being unpatentable over Kawashaki et al. Patent Number 6281552. In further view of, Sasaki et al. Patent Number 5970368.

Kawasaki discloses the claimed invention except for the plurality of protrusions formed on the semiconductor film after the irradiation.

Sasaki teaches that it is known to use a base film (an undercoat film) of the semiconductor film; with a heat resistance property and thermal conductivity property (implied heat absorbing layer) the heat dissipation from the part where molten by irradiation using a high energy beam (laser) to the substrate is suppressed. In addition, the high energy beam (laser) is irradiated onto a surface of a semiconductor film of amorphous material, melting the

Art Unit: 2812

semiconductor film, and further solidifying the semiconductor film to form a polycrystal film having polycrystal grains with uniform and large diameter forming standing waves (another word for protrusions) due to prolongation of solidification time. In addition, referring to the thin film transistor-liquid crystal display (TFT-LCD), the standing wave (protrusions) is formed on the surface of semiconductor film by applying at least one laser beam to a predetermined position of the surface of the amorphous semiconductor film at a predetermined incident angle and in polarization state for form a standing wave (protrusions), and generating a heat density distribution in the same cycle as the standing wave to melt the semiconductor. As shown in figure 10A, the laser beam (1) is split with a beam splitter 3a. Then are split into two beams (irradiation) are allowed to be intersected and interfered so that a standing wave having a cycle of the waveform order is formed on the surface of the semiconductor film (9).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an undercoat film (base film) with heat resistively and thermal conductivity (heat absorbing layer) under an amorphous semiconductor film and apply an energy beam such as a laser to form polycrystal grains having uniform and larger diameters to form standing waves (protrusions) as taught by Sasaki, since Sasaki states at column 7, lines 10, 23-25, 31-39, 45-56, 60-63, col. 9 lines 17-23, 65-67 and col. 13 lines 61-65 such as to combine the teaching Sasaki with the teaching of Kawaski with Sasaki's motivation of improving crystallinity to the polycrystal semiconductor film due to prolonged irradiation and solidification time.

Art Unit: 2812

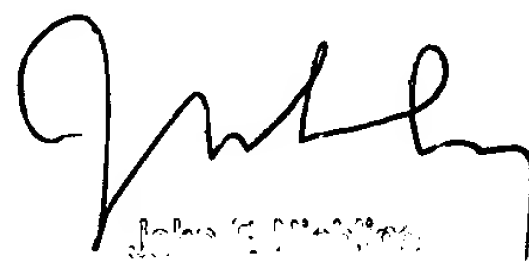
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanetta D. Isaac whose telephone number is 703-308-5871. The examiner can normally be reached on Monday-Friday 7:30am -5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Nebling can be reached on 703-308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Stanetta Isaac
Patent Examiner
August 16, 2002



John Nebling
Supervisor
Patent Examination Unit